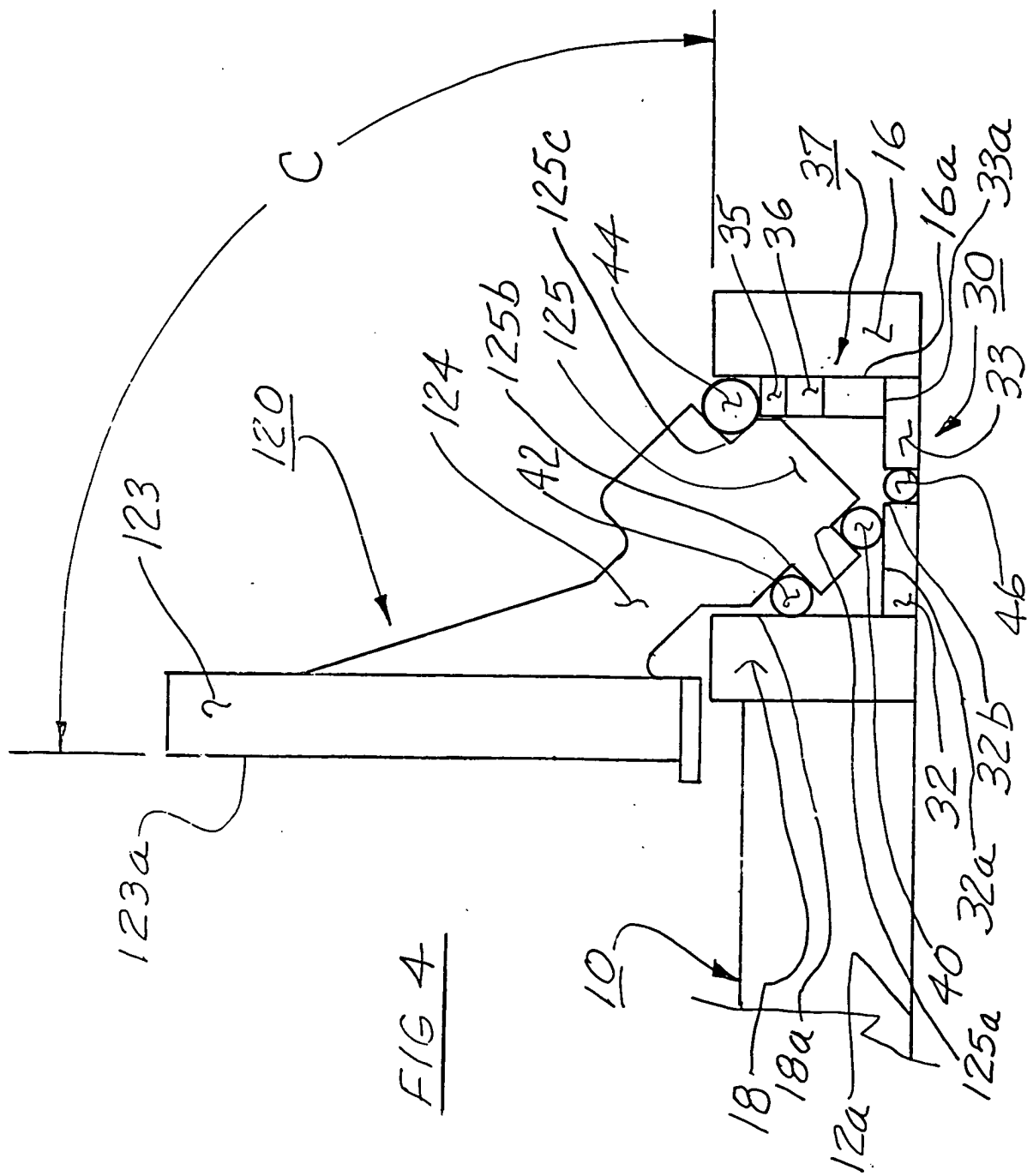


FIG 3



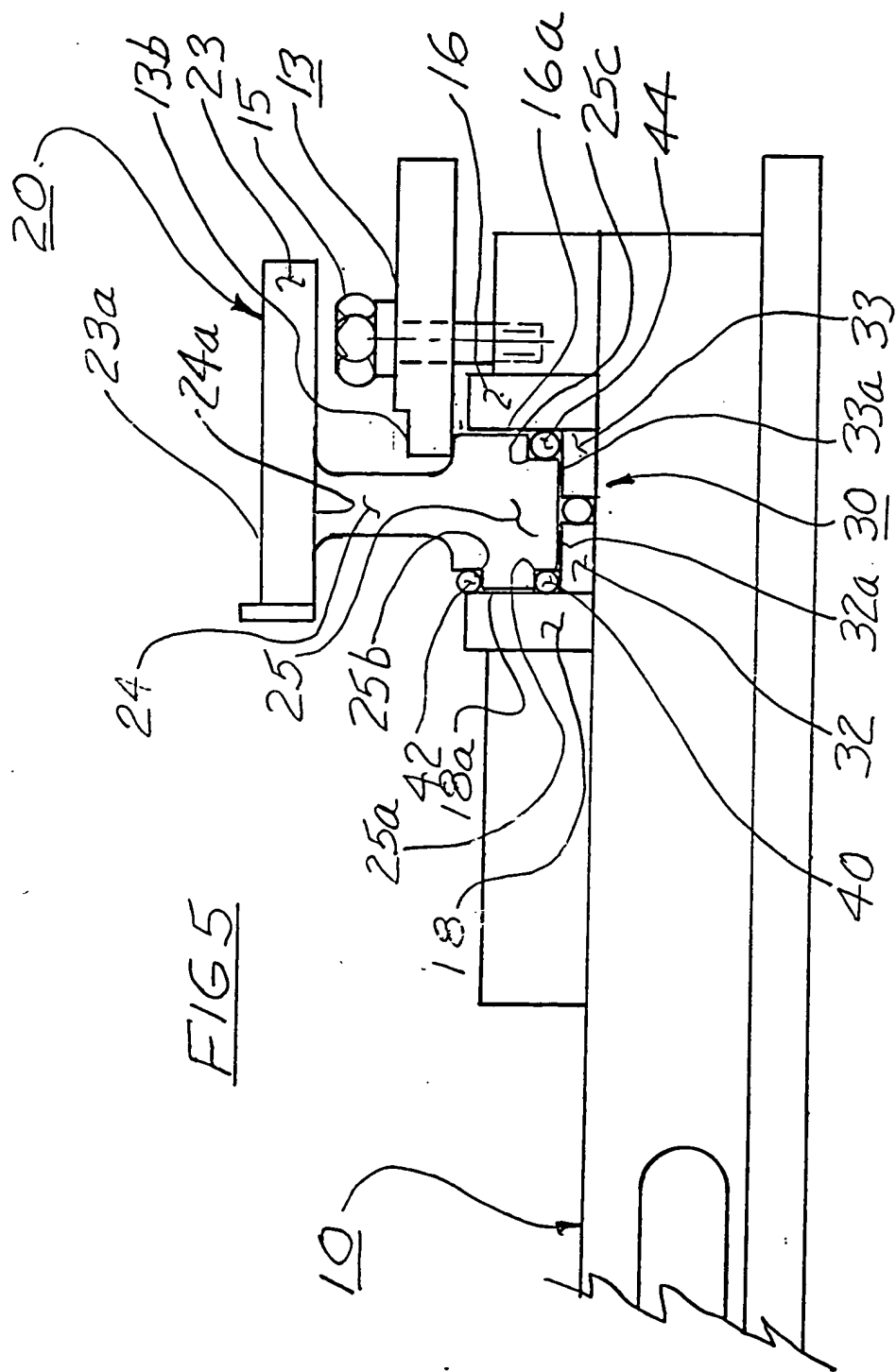


FIG 6b

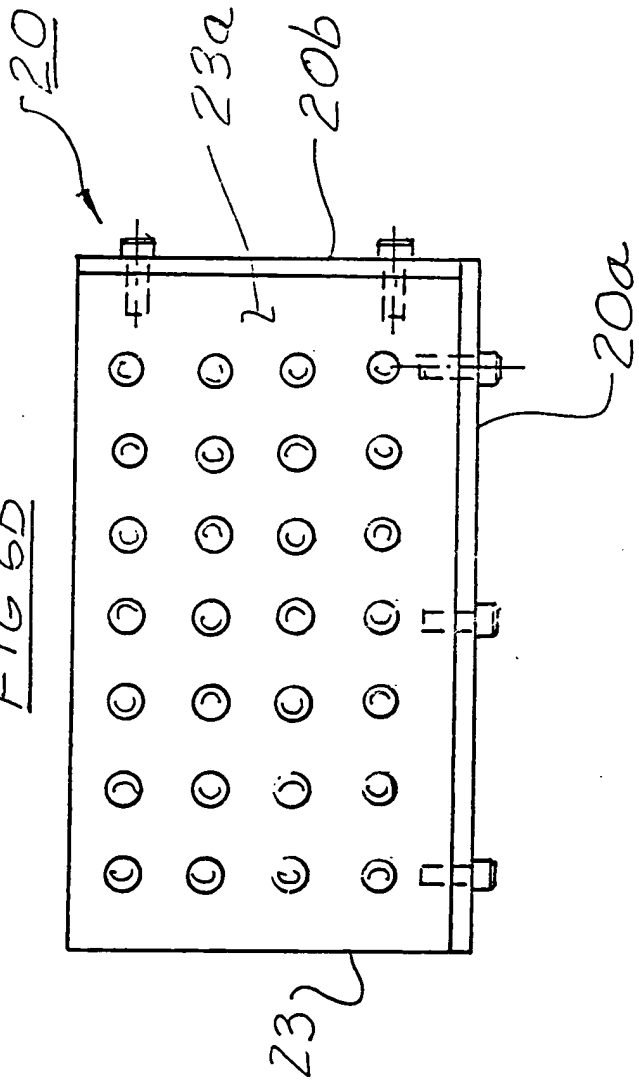


FIG 6

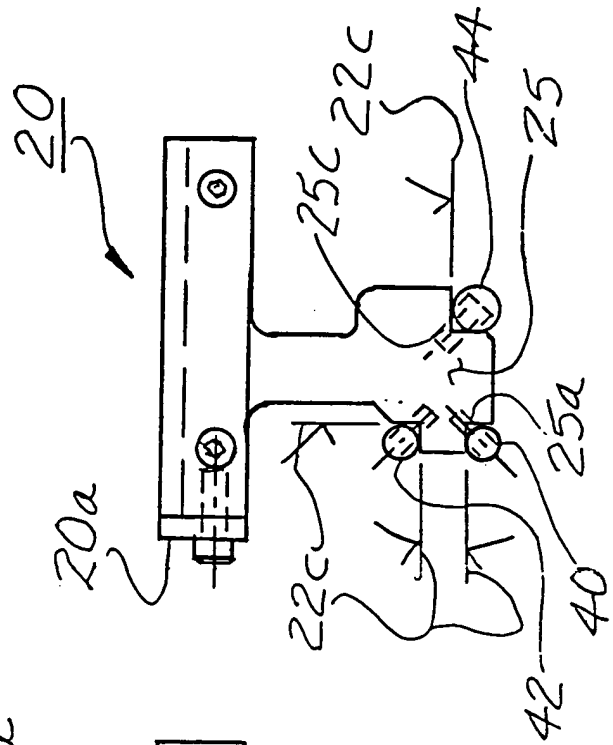


FIG 6a

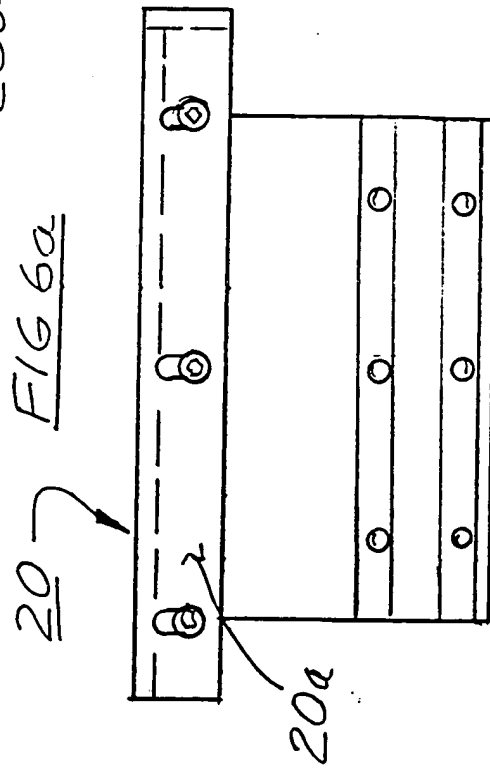


FIG 7b

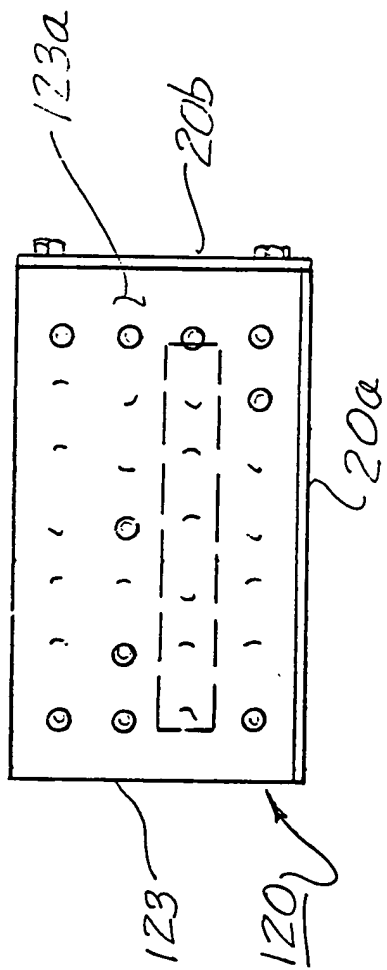


FIG 7

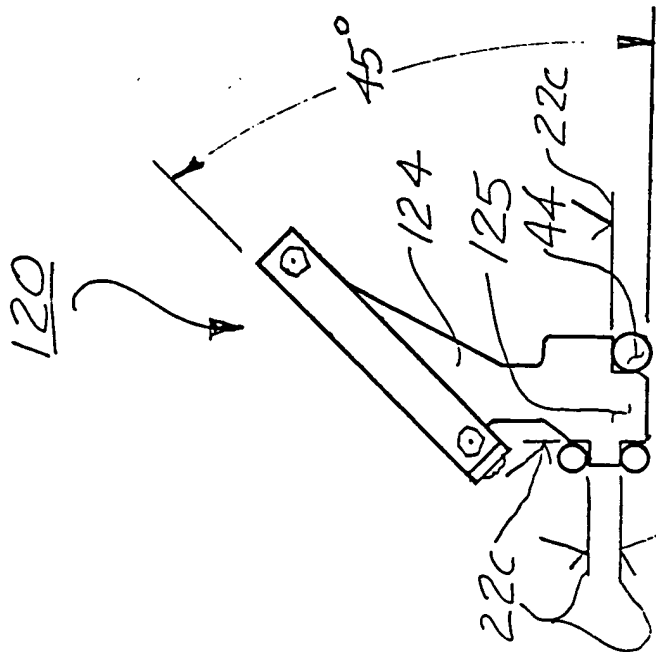
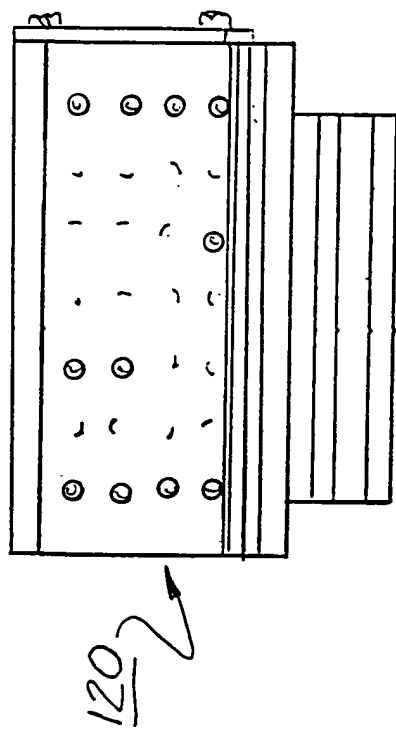


FIG 7a





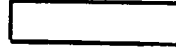


FIG 8

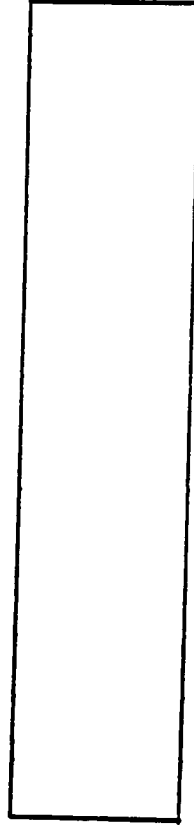
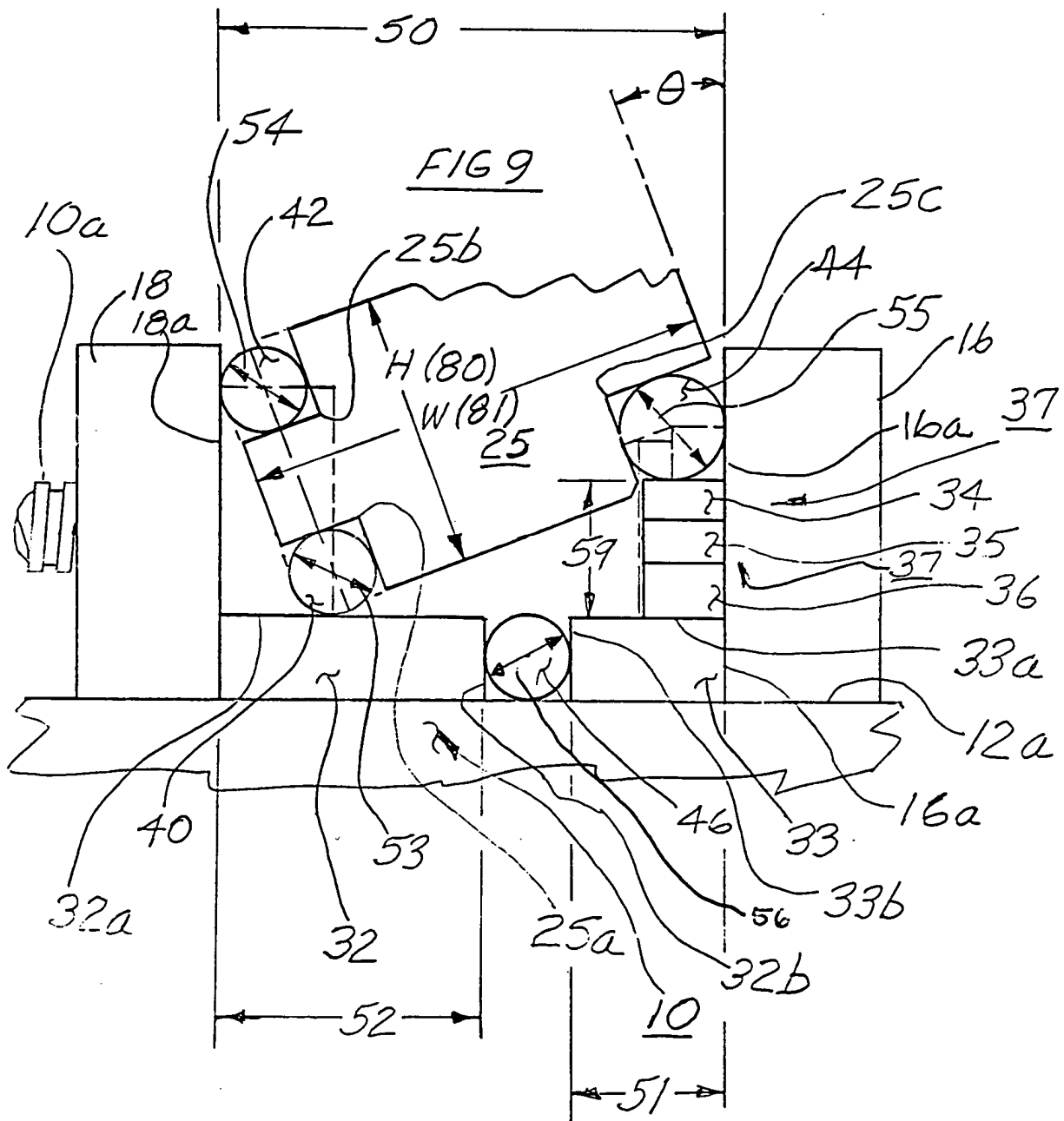


FIG 8a



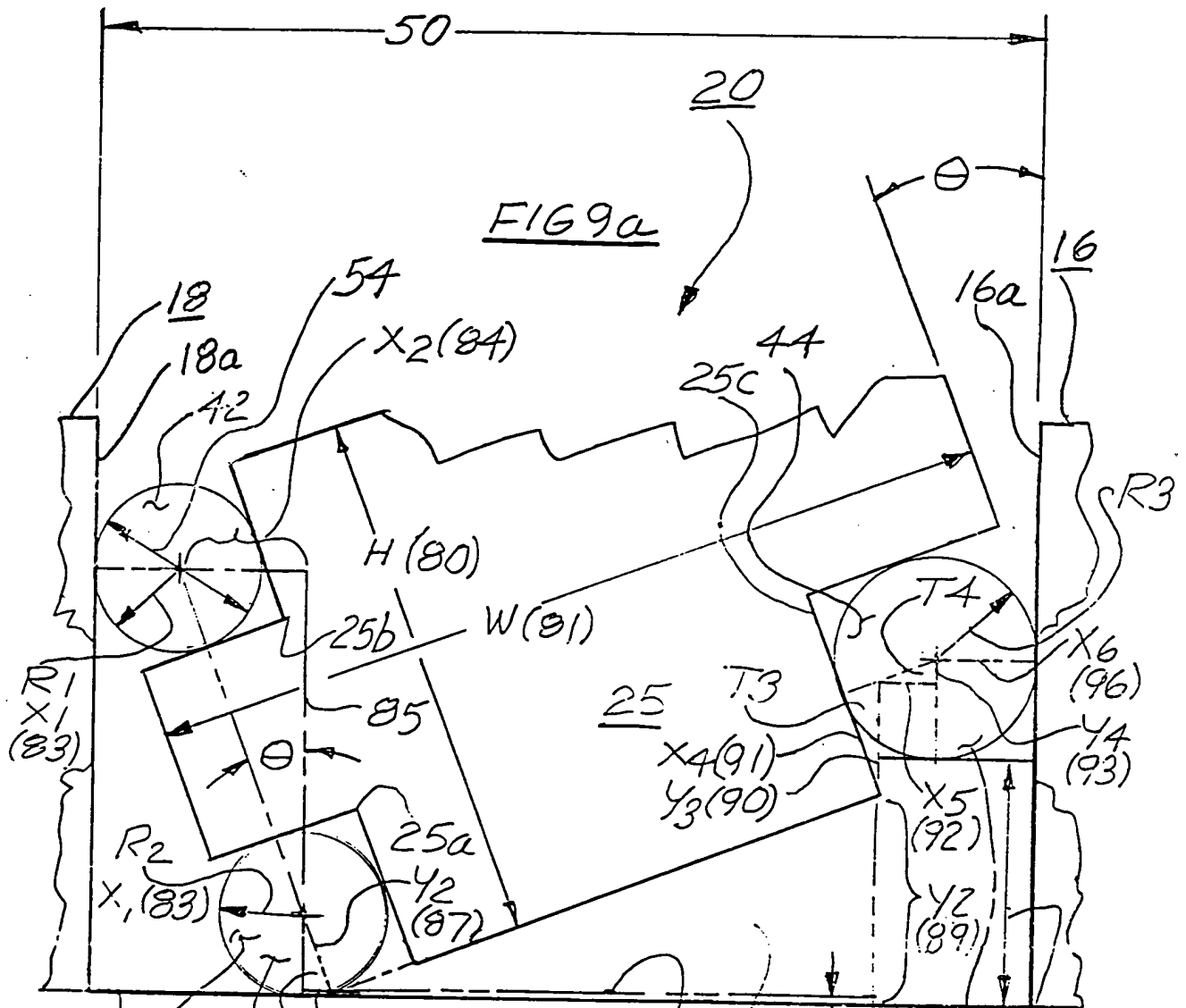


FIG 9b

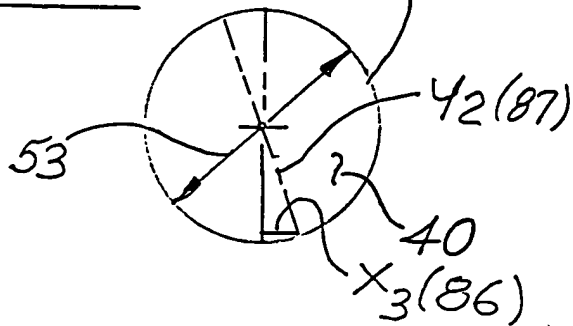
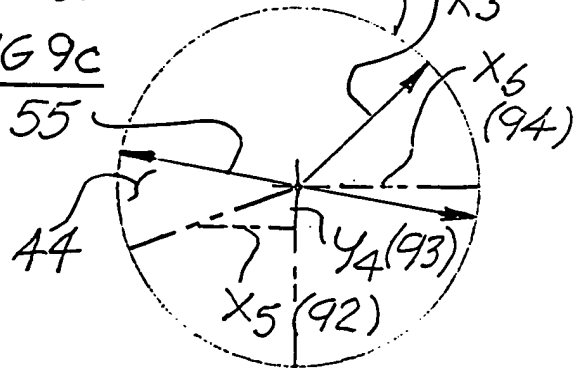


FIG 9c



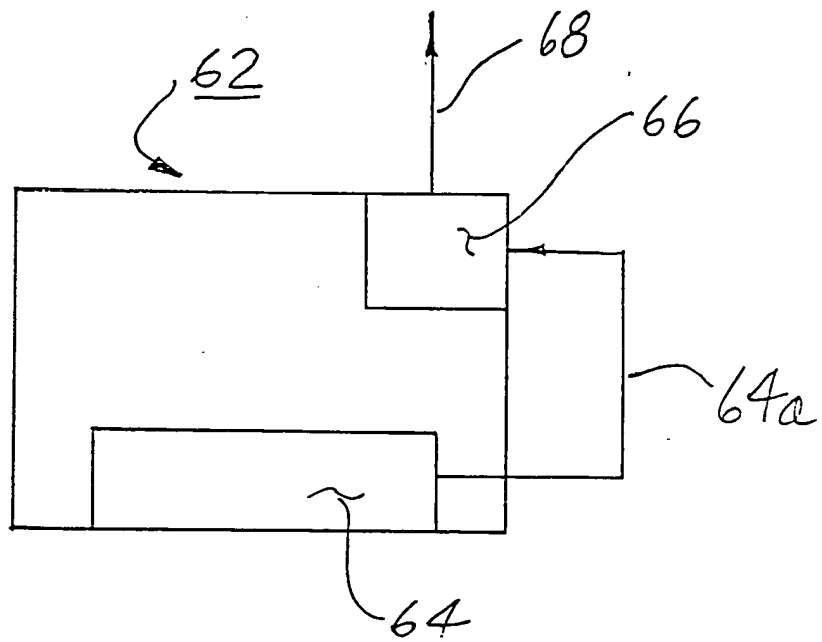


FIG 10

Trefry 0 to 45 degree Tooling Program (Tool #1)

Program Inputs:

0 Tool Block Angle = 45.000 degrees  
 1 Overall Pin No 1 to Pin No 2 Height = 1.250 inches  
 2 Overall Pin No 2 to Pin No 3 Width = 2.001 inches  
 3 Horizontal Spacer Block No 1 = 1.250 inches  
 32 Horizontal Spacer Block No 2 = 0.500 inches  
 57 Manufacturing Misalignment = 0.000 inches  
 53 Diameter of Pin No 1 = 0.375 inches (REF)  
 54 Diameter of Pin No 2 = 0.375 inches (REF)  
 55 Diameter of Pin No 3 = 0.500 inches (REF)

(offset of Pin No 3 below horizontal plane of Pin No 2)

Program Outputs:

Should Tool No 1 or Tool No 2 be used? Use Tool No 1  
 Vice Opening Dimension = 2.1176 inches  
 Vice Opening Pin Diameter = 0.3676 inches  
 Vertical Clamping Blocks Dimension = 1.0873 inches

Geometry Calculations:

Tool Angle with respect to tool base = 0.7854 radians  
 X1 = 0.1875 inches  
 X2 = 0.6187 inches  
 X3 = 0.1326 inches  
 X4 = 0.9288 inches  
 X5 = 0.0000 inches  
 X6 = 0.2500 inches  
 Xdimension = 2.1176 inches  
 Y1 = 0.0549 inches  
 Y2 = 0.9288 inches  
 Y3 = 0.3536 inches  
 Y4 = 0.0000 inches  
 Y5 = 0.2500 inches  
 Ydimension = 1.0873 inches

Fig. 12

Drawing ID	Formula
Angle (B) (C) (A)	B=45 degrees or (n)=C; A=90 or (n) degrees
$x_1(83)=$	$r_1$
$x_4(84)=$	$(H-r_1-r_2)\sin \theta$
$x_3(86)=$	$Y_2\sin \theta$
$x_4(88)=$	$(W-d_3-y_2)\cos \theta$
$x_5(92)=$	$r_3(1-\tan \theta)\cos \theta$
$x_6(94)=$	$r_3$
$y_1(96)=$	$r_2(1-\cos \theta)$
$y_2(87)=$	$(W-d_3-r_2)\sin \theta$
$y_3(90)=$	$r_3/\cos \theta$
$y_4(93)=$	$r_3(1-\tan \theta)\sin \theta$
$y_5(95)=$	$r_3$
For Possible Misalignment	
$x_5(92)=$	$(r_3-(r_3-m)\tan \theta)\cos \theta$
$y_3(90)=$	$r_3-m/\cos \theta$
$y_4(93)=$	$(r_3-(r_2-m)\tan \theta)\sin \theta$

The following table generates Outputs based on Inputs for 0 to 45 degrees:

Tool Block Angle $\Theta$	Radians	Tool No $\rightarrow$	Vice Opening Dimension $\Phi$ (inches)	Vice Opening Pin Diameter $\Phi$ (inches)	Vertical Clamping Blocks Dimension $\Phi$ (inches)
0.0	0.0000	Tool No 1	2.0010	0.2510	0.0000
0.5	0.0087	Tool No 1	2.0080	0.2580	0.0136
1.0	0.0175	Tool No 1	2.0149	0.2649	0.0273
1.5	0.0262	Tool No 1	2.0217	0.2717	0.0409
2.0	0.0349	Tool No 1	2.0284	0.2784	0.0545
2.5	0.0436	Tool No 1	2.0350	0.2850	0.0681
3.0	0.0524	Tool No 1	2.0414	0.2914	0.0817
3.5	0.0611	Tool No 1	2.0477	0.2977	0.0953
4.0	0.0698	Tool No 1	2.0539	0.3039	0.1089
4.5	0.0785	Tool No 1	2.0599	0.3099	0.1225
5.0	0.0873	Tool No 1	2.0659	0.3159	0.1360
5.5	0.0960	Tool No 1	2.0717	0.3217	0.1496
6.0	0.1047	Tool No 1	2.0774	0.3274	0.1631
6.5	0.1134	Tool No 1	2.0829	0.3329	0.1766
7.0	0.1222	Tool No 1	2.0884	0.3384	0.1901
7.5	0.1309	Tool No 1	2.0937	0.3437	0.2035
8.0	0.1396	Tool No 1	2.0989	0.3489	0.2170
8.5	0.1484	Tool No 1	2.1039	0.3539	0.2304
9.0	0.1571	Tool No 1	2.1089	0.3589	0.2438
9.5	0.1658	Tool No 1	2.1137	0.3637	0.2572
10.0	0.1745	Tool No 1	2.1183	0.3683	0.2705
10.5	0.1833	Tool No 1	2.1229	0.3729	0.2839
11.0	0.1920	Tool No 1	2.1273	0.3773	0.2972
11.5	0.2007	Tool No 1	2.1316	0.3816	0.3105
12.0	0.2094	Tool No 1	2.1358	0.3858	0.3237
12.5	0.2182	Tool No 1	2.1398	0.3898	0.3369
13.0	0.2269	Tool No 1	2.1437	0.3937	0.3501
13.5	0.2356	Tool No 1	2.1475	0.3975	0.3633
14.0	0.2443	Tool No 1	2.1511	0.4011	0.3764
14.5	0.2531	Tool No 1	2.1546	0.4046	0.3895
15.0	0.2618	Tool No 1	2.1580	0.4080	0.4025
15.5	0.2705	Tool No 1	2.1613	0.4113	0.4156
16.0	0.2793	Tool No 1	2.1644	0.4144	0.4285
16.5	0.2880	Tool No 1	2.1674	0.4174	0.4415

FIG. 13b

17.0	0.2967	Tool No 1	2.1702	0.4202	0.4544
17.5	0.3054	Tool No 1	2.1730	0.4230	0.4673
18.0	0.3142	Tool No 1	2.1756	0.4256	0.4801
18.5	0.3229	Tool No 1	2.1780	0.4280	0.4929
19.0	0.3316	Tool No 1	2.1803	0.4303	0.5056
19.5	0.3403	Tool No 1	2.1825	0.4325	0.5183
20.0	0.3491	Tool No 1	2.1846	0.4346	0.5310
20.5	0.3578	Tool No 1	2.1865	0.4365	0.5436
21.0	0.3665	Tool No 1	2.1883	0.4383	0.5562
21.5	0.3752	Tool No 1	2.1900	0.4400	0.5687
22.0	0.3840	Tool No 1	2.1915	0.4415	0.5811
22.5	0.3927	Tool No 1	2.1929	0.4429	0.5936
23.0	0.4014	Tool No 1	2.1942	0.4442	0.6059
23.5	0.4102	Tool No 1	2.1953	0.4453	0.6183
24.0	0.4189	Tool No 1	2.1963	0.4463	0.6305
24.5	0.4276	Tool No 1	2.1972	0.4472	0.6427
25.0	0.4363	Tool No 1	2.1979	0.4479	0.6549
25.5	0.4451	Tool No 1	2.1985	0.4485	0.6670
26.0	0.4538	Tool No 1	2.1989	0.4489	0.6791
26.5	0.4625	Tool No 1	2.1993	0.4493	0.6911
27.0	0.4712	Tool No 1	2.1995	0.4495	0.7030
27.5	0.4800	Tool No 1	2.1995	0.4495	0.7149
28.0	0.4887	Tool No 1	2.1994	0.4494	0.7267
28.5	0.4974	Tool No 1	2.1992	0.4492	0.7385
29.0	0.5061	Tool No 1	2.1989	0.4489	0.7502
29.5	0.5149	Tool No 1	2.1984	0.4484	0.7618
30.0	0.5236	Tool No 1	2.1978	0.4478	0.7734
30.5	0.5323	Tool No 1	2.1970	0.4470	0.7849
31.0	0.5411	Tool No 1	2.1961	0.4461	0.7963
31.5	0.5498	Tool No 1	2.1951	0.4451	0.8077
32.0	0.5585	Tool No 1	2.1940	0.4440	0.8190
32.5	0.5672	Tool No 1	2.1927	0.4427	0.8303
33.0	0.5760	Tool No 1	2.1913	0.4413	0.8415
33.5	0.5847	Tool No 1	2.1897	0.4397	0.8526
34.0	0.5934	Tool No 1	2.1880	0.4380	0.8636
34.5	0.6021	Tool No 1	2.1862	0.4362	0.8746
35.0	0.6109	Tool No 1	2.1843	0.4343	0.8855



# FIG 13 C

35.5	0.6196	Tool No 1	2.1822	0.4322	0.8963
36.0	0.6283	Tool No 1	2.1800	0.4300	0.9071
36.5	0.6370	Tool No 1	2.1776	0.4276	0.9177
37.0	0.6458	Tool No 1	2.1751	0.4251	0.9284
37.5	0.6545	Tool No 1	2.1725	0.4225	0.9389
38.0	0.6632	Tool No 1	2.1698	0.4198	0.9493
38.5	0.6720	Tool No 1	2.1669	0.4169	0.9597
39.0	0.6807	Tool No 1	2.1639	0.4139	0.9700
39.5	0.6894	Tool No 1	2.1607	0.4107	0.9802
40.0	0.6981	Tool No 1	2.1575	0.4075	0.9904
40.5	0.7069	Tool No 1	2.1541	0.4041	1.0004
41.0	0.7156	Tool No 1	2.1505	0.4005	1.0104
41.5	0.7243	Tool No 1	2.1469	0.3969	1.0203
42.0	0.7330	Tool No 1	2.1431	0.3931	1.0301
42.5	0.7418	Tool No 1	2.1392	0.3892	1.0399
43.0	0.7505	Tool No 1	2.1351	0.3851	1.0495
43.5	0.7592	Tool No 1	2.1309	0.3809	1.0591
44.0	0.7679	Tool No 1	2.1266	0.3766	1.0686
44.5	0.7767	Tool No 1	2.1222	0.3722	1.0779
45.0	0.7854	Tool No 1	2.1176	0.3676	1.0873

FIG 14

